MULTIMEDIA UNIVERSITY

STUDENT ID NO

MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 2, 2015/2016

BFN3174 – FINANCIAL MODELLING

(All sections / Groups)

9 MARCH 2016
2:30 p.m. – 4:30 p.m.
(2 Hours)

INSTRUCTIONS TO STUDENTS

2. This question paper consists of **FOUR (4)** printed pages (excluding the cover page) with **FOUR (4)** questions.

3. Answer **ALL** questions in the **Excel template** provided in the thumbdrive.

4. Marks are shown at the end of each question.

Question 1 (25 MARKS)

You borrow RM900,000 as an annuity loan over 10 years at 6 per cent interest per annum. Interest and principal are paid at the end of each quarter.

a. Make a detailed payment schedule for the loan.

(13.5 marks)

b. Assume that you can pay no more than RM25,000 each quarter in interest and principal. How many years will it take for you to pay back the loan?

(3.5 marks)

c. Generate a **Data Table** to calculate the number of years taken to pay back a loan for different payment amounts. Start from RM15,000 to RM90,000 with increments of RM5,000.

(5 marks)

d. Draw a graph depicting the relationship between the number of years to pay off the loan and the amount of payment made each quarter.

(3 marks)

Continued...

QUESTION 2 (25 MARKS)

The expected returns and variance-covariance matrix of four assets are given as follows:

Expected Returns				
Stock A	1.32%			
Stock B	1.21%			
Stock C	1.81%			
Stock D	0.73%			
Variance-Covariance Matrix				
	Stock A	Stock B	Stock C	Stock D
Stock A	0.47%	0.37%	0.40%	0.21%
Stock B	0.37%	0.48%	0.40%	0.21%
Stock C	0.40%	0.40%	0.59%	0.27%
Stock D	0.21%	0.21%	0.27%	0.39%

a. Calculate the correlation between each stock.

(10 marks)

b. If you plan to invest in a portfolio consisting of equal proportions for all stocks, what is the expected return and standard deviation of the portfolio?

(8 marks)

c. Assuming no short selling is allowed, i.e. all weights must be greater than or equal to zero and the sum of weights must be equal to one (1), calculate the weight of each stock in the portfolio that minimizes the portfolios risk. Start by assuming equal weightage in each stock and then use **Excel Solver** to calculate the weights.

(7 marks)

Continued...

QUESTION 3 (25 MARKS)

A stock's present price is RM10. The standard deviation for the yearly returns on the stock is 20% per annum. The return on a risk-free investment is 3% per annum.

a. Use the Black-Scholes model to calculate the price of call and put options on the stock that expires in six months. Assume that the exercise price is RM10.50.

(9 marks)

b. Create **Data Tables** showing the sensitivity of the option price to changes in the stock price and the standard deviation.

(10 marks)

c. Create charts to show the relationships in part b).

(6 marks)

Continued...

QUESTION 4 (25 MARKS)

A 4 year bond with a face value of RM1,000 and an annual coupon rate of 3% has a yield to maturity of 2.5%. This bond makes 2 (semi-annual) coupon payments per year.

a. What is the Effective Annual Rate (EAR) of this bond?

(6.5 marks)

b. What is the price of this bond?

(3 marks)

c. What is the duration of this bond? Use both the conventional duration formula and the **DURATION** function in Excel. Assume the settlement date to be 3 February 2015.

(11.5 marks)

d. What is the modified duration of this bond? Use both the conventional formula and the **MDURATION** function in Excel. Assume the settlement date to be 3 February 2015.

(4 marks)

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